

Appl. No. 10/064,736
Amdt. dated 10/24/05
Reply to Office action of 09/23/2005

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1 (original): A process for removing SO₂, NO, and NO₂ from a gas stream comprising the steps of

- a. oxidizing at least a portion of the NO in a gas stream to NO₂ with a dielectric barrier discharge reactor, and
- b. scrubbing at least a portion of SO₂, NO, and NO₂ from the gas stream with a dual alkali scrubber.

2 (original): The process of claim 1, said scrubbing step having a scrubbing solution comprising at least one taken from the group consisting of alkali hydroxide, alkali carbonate, ammonia, and ammonium hydroxide.

3 (original): The process of claim 1, further comprising the step of regenerating the scrubbing solution with a Group II oxide, a Group II hydroxide, or a Group II carbonate.

4 – 8 (canceled)

9 (currently amended): A process for removing SO₂, NO, and NO₂ from a gas stream comprising the steps of

a. oxidizing at least a portion of NO in a gas stream to NO₂ with ~~The process of claim 8, wherein said electrical discharge reactor is a dielectric barrier discharge reactor, followed by~~

b. scrubbing at least a portion of SO₂, NO, and NO₂ from the gas stream with a scrubbing solution comprising an alkali hydroxide or an alkali carbonate, followed by

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c. regenerating the scrubbing solution with a Group II oxide, a Group II hydroxide or a Group II carbonate, and d. removing at least a portion of any aerosols generated from the scrubbing step from the gas stream with an aerosol remover.

10 (original): The process of claim 9, further comprising the step of oxidizing at least a portion of the NO to HNO₃ with said dielectric barrier discharge reactor.

11 – 17 (canceled)

18 (currently amended): A process for removing SO₂, NO, NO₂, and Hg from a gas stream comprising the steps of

a. oxidizing at least a portion of NO in a gas stream to NO₂ and Hg to oxidized Hg with ~~The process of claim 17, wherein said electrical discharge reactor is a dielectric barrier discharge reactor, followed by~~

b. scrubbing at least a portion of SO₂, NO, and NO₂ from the gas stream with a scrubbing solution comprising at least one taken from the group consisting of alkali hydroxide, alkali carbonate, ammonia, and ammonium hydroxide, followed by

c. regenerating the scrubbing solution with a Group II oxide, a Group II hydroxide, or a Group II carbonate, and

d. removing at least a portion of the oxidized Hg and any aerosols generated from the scrubbing step from the gas stream with an aerosol remover.

19 (original): The process of claim 18, further comprising the step of oxidizing at least a portion of the NO to HNO₃ with said dielectric barrier discharge reactor.

20 – 24 (canceled)

25 (withdrawn): An apparatus for removing SO₂, NO, and NO₂ from a gas stream comprising

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a. an oxidizer for oxidizing at least a portion of the NO in a gas stream to NO₂,

b. a scrubber suitably adapted to scrub at least a portion of the SO₂, NO, and NO₂ from the gas stream with a scrubbing solution comprising at least one taken from the group consisting of alkali hydroxide, alkali carbonate, ammonia, and ammonium hydroxide,

c. a scrubbing solution regenerator, and

d. an aerosol remover for removing at least a portion of any aerosols generated by the scrubber from the gas stream.

26 (withdrawn): The apparatus of claim 25, said oxidizer comprising an electrical discharge reactor.

27 (withdrawn): The apparatus of claim 26, wherein said electrical discharge reactor is a dielectric barrier discharge reactor.

28 (withdrawn): The apparatus of claim 27, wherein said dielectric barrier discharge reactor is adapted to oxidize at least a portion of the NO to NO₂ and HNO₃.

29 (withdrawn): The apparatus of claim 25, wherein said alkali is at least one taken from the group consisting of sodium, potassium, ammonia and ammonium hydroxide.

30 (withdrawn): The apparatus of claim 25, said aerosol remover comprising at least one of a mist eliminator and a wet electrostatic precipitator.

31 (withdrawn): An apparatus for removing SO₂, NO, NO₂, and Hg from a gas stream comprising

a. an oxidizer for oxidizing at least a portion of the NO in a gas stream to NO₂, and at least a portion of the Hg in a gas stream to oxidized Hg, followed by

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b. a scrubber suitably adapted to scrub at least a portion of the SO₂, NO, and NO₂ from the gas stream with a scrubbing solution comprising at least one taken from the group consisting of alkali hydroxide, alkali carbonate, ammonia and ammonium hydroxide,

c. a scrubbing solution regenerator, and

d. an aerosol remover for removing at least a portion of the oxidized Hg and any aerosols generated by the scrubber from the gas stream.

32 (withdrawn): The apparatus of claim 31, said oxidizer comprising an electrical discharge reactor.

33 (withdrawn): The apparatus of claim 32, wherein said electrical discharge reactor is a dielectric barrier discharge reactor.

34 (withdrawn): The apparatus of claim 33, wherein said dielectric barrier discharge reactor is adapted to oxidize at least a portion of the NO to NO₂ and HNO₃.

35 (withdrawn): The apparatus of claim 31, wherein said alkali is at least one taken from the group consisting of sodium, potassium, ammonia and ammonium hydroxide.

36 (withdrawn): The apparatus of claim 31, said aerosol remover comprising at least one of a mist eliminator and wet electrostatic precipitator.